Report of Meeting
L-37-1 Surveillance Panel Conference Call
August 10th, 2022

Attendees:

SwRI -	**Mueller,** Kostan, Charron
Lubrizol -	Venhoff, **Slocum**, Schaup
Afton -	**Sangpeal,** Bell, Horvath
Intertek -	**Lange,** Portell
TMC -	**Beck**
ExxonMobil -	**Banas**
BASF -	**Goyal,** Mosher, Caridi
Dana -	**Zyski**
Meritor -	LaBond, **Carter**
Army -	Sattler
AAM -	**Muransky**
Shell -	Uy
Chevron -	Warden
Daimler -	Neal
Retired -	Kanga

Voting Members in **BOLD**

1.0 Membership Review

- Remove Mike Cabaj

2.0 Meeting minutes Approval

– May 11th, 2022, ASTM Meeting #205

Motion #1 → R. Slocum 1st /2nd A. Lange to approve the meeting minutes from the May 11th, 2022, ASTM Meeting. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

3.0 L-37-1 LTMS/TCR Discussion

- TMC provided TCR's to the labs generated with Zi limit +/- 1.5 to see if it would have any effect on labs current calibration status
- One lab would have been affected at the Zi of 1.5 for Rippling(mild)
- Discussion around the lab out calibration on Rippling(mild)
  - What would severity adjustments entail or look like?
  - Talk around ratings – **Action Item: could the mild lab send gears to the other labs to rate and vice versa would some labs have some a little more severe to send to our lab for rating**
  - Can rippling and ridging mask each other's overall rating?
    - Travis showed that there does not seem to be a correlation

Action Item: - Operational Data – create similar template like L60

4.0 MnP Coated batch approval process

- Each lab will run Gleason 2021 MnP Coated 3 times using the 3 reference oils
- Was talk if we need to start using 152-2 to solely use for referencing MnP Coated using the Canadian procedure
- Should Standard just use 134/155 and Canadian use 152-2??

Motion #2 → A. Lange 1st /2nd C. Mueller to approve that the approval runs will not count towards the number of allowable candidate runs. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

5.0 Gleason Match # issue

- Couple labs have had parts with match numbers but no matching ring and pinion sets
  - Lubrizol had 24 rings with no match numbers whatsoever
- Pinions and rings seem to have sharp edges and burrs in the heel area of both the pinion and ring
  - Lubrizol broke teeth 3 times with fail oil. Are these sharp areas contributing to the failures?
    - Will attempt to file down sharp edges and rerun

Action Item: Need to get a list of questions and concerns between the labs and attempt to set up a conference call with Gleason

6.0 Old Business

- LTMS "Lubrited" removal vote

Motion #3 → T. Muransky 1st /2nd A. Goyal to approve the replacement of Non-Lubrited and Lubrited with Uncoated and MnP Coated respectively throughout the entire LTMS document effective 8/24/2022. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

Action Item: Labs will need to eventually address reporting databases so reports have the replaced wording of Non-Lubrited and Lubrited with Uncoated and MnP Coated.

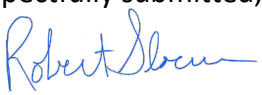
7.0 New Business

- Wes has had some communication with a Dana representative if the industry would be interested in Dana gear sets in the future

8.0 Adjourn

Motion #4 → A. Goyal 1st /2nd T. Muransky to adjourn. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

Respectfully submitted,



Robert Slocum
L-37-1 Surveillance Panel Chairman

D02.B0.03

L-37-1 Surveillance Panel Meeting

08/10/2022
15:00 pm – 16:00 pm
Robert Slocum

Agenda

- Call to Order/Agenda review
- Membership Review
- Meeting Minute Approvals
- May 11th, 2022, ASTM Meeting
- L-37-1 LTMS/TCR Discussion
- MnP Coated batch approval process
- Gleason Match # issue
- Old Business
  - LTMS “Lubrited” removal vote
- New business
- Adjournment

Membership Review

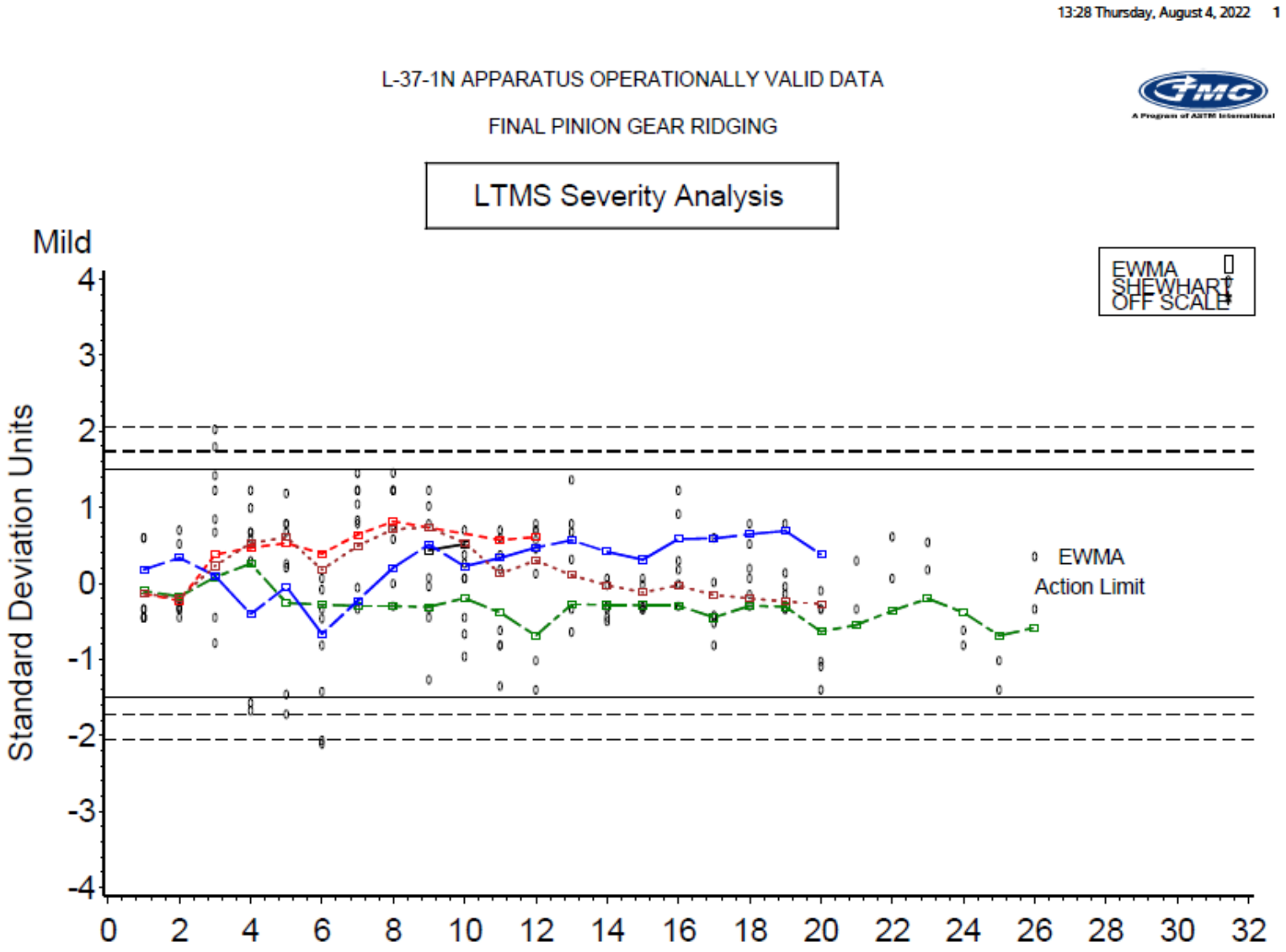
Rob Banas	ExxonMobil
Allen Comfort	US Army
Troy Muransky	AAM
Matt Sangpeal	Afton
Arjun Goyal	BASF
Amy Zyski	Dana
Dylan Beck	TMC
Jason Carter	Meritor
Anthony Lange	Intertek
Robert Slocum	Lubrizol
Caroline Mueller	SwRI
Kaled Zreik	GM
Mike Cabaj	Linamar

Total Voting Members = 13

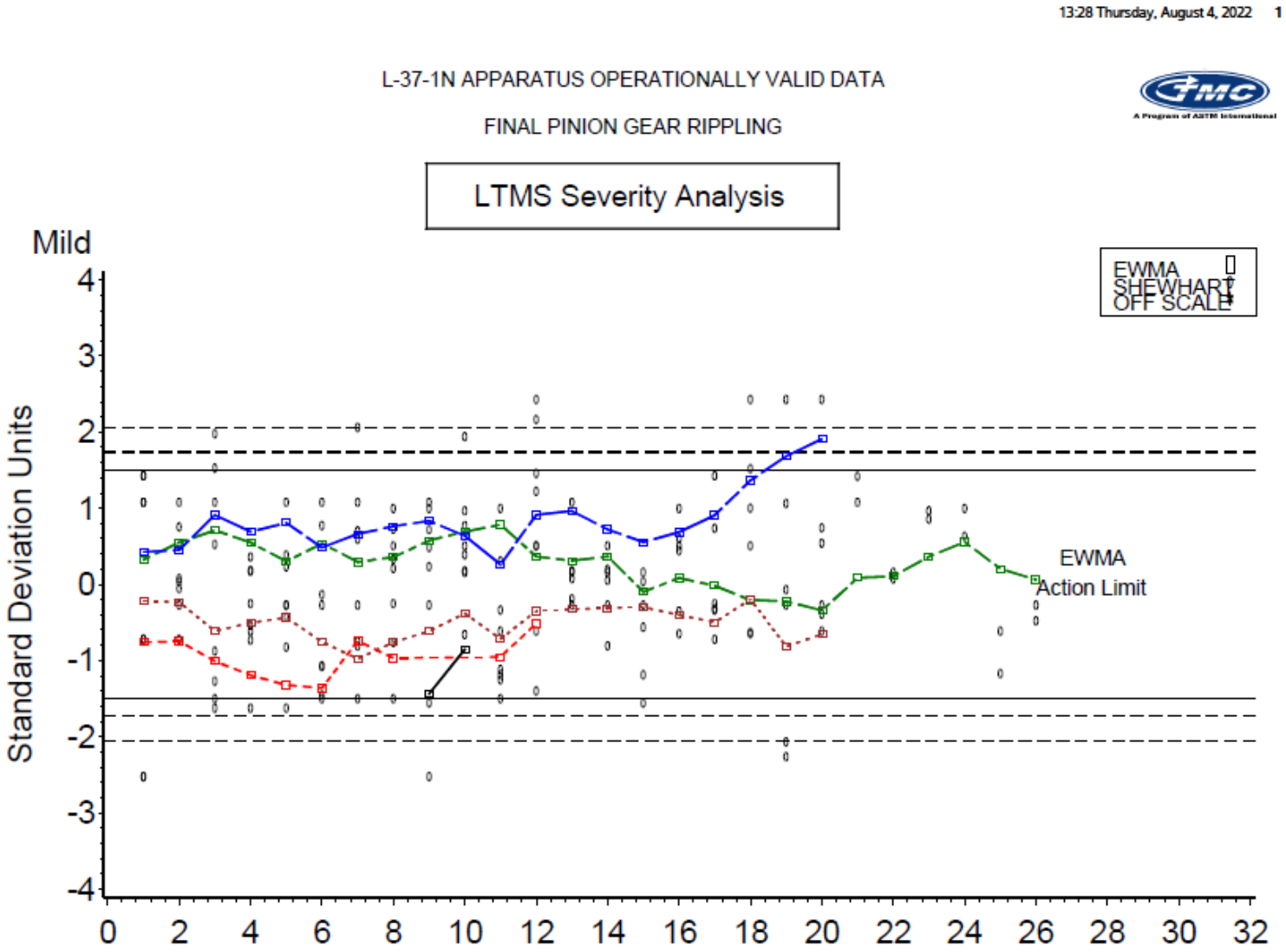
Meeting Minutes Approval

- May 11th , 2022, ASTM Meeting

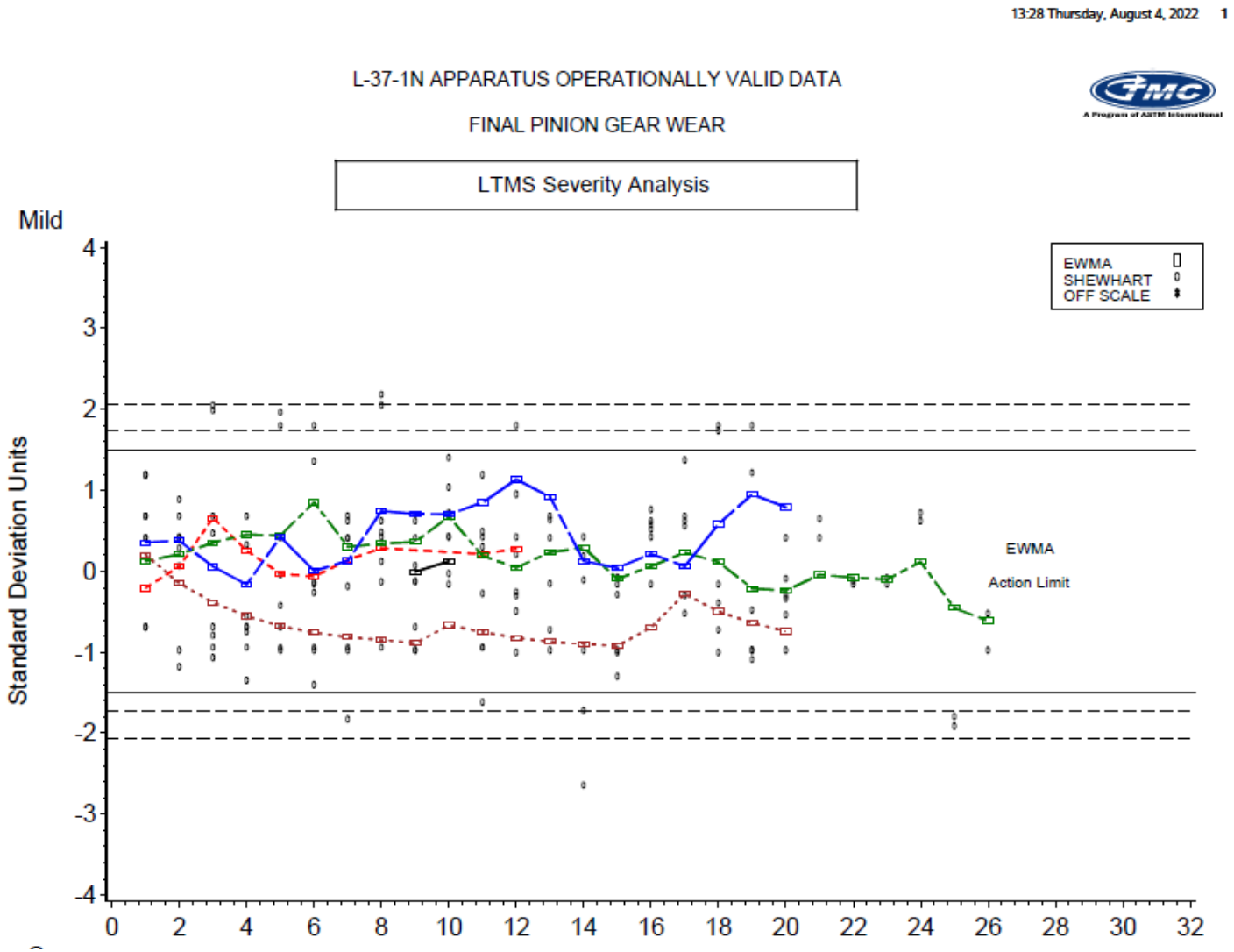
L-37-1 LTMS/TCR Discussion Z(i)=+/- 1.5



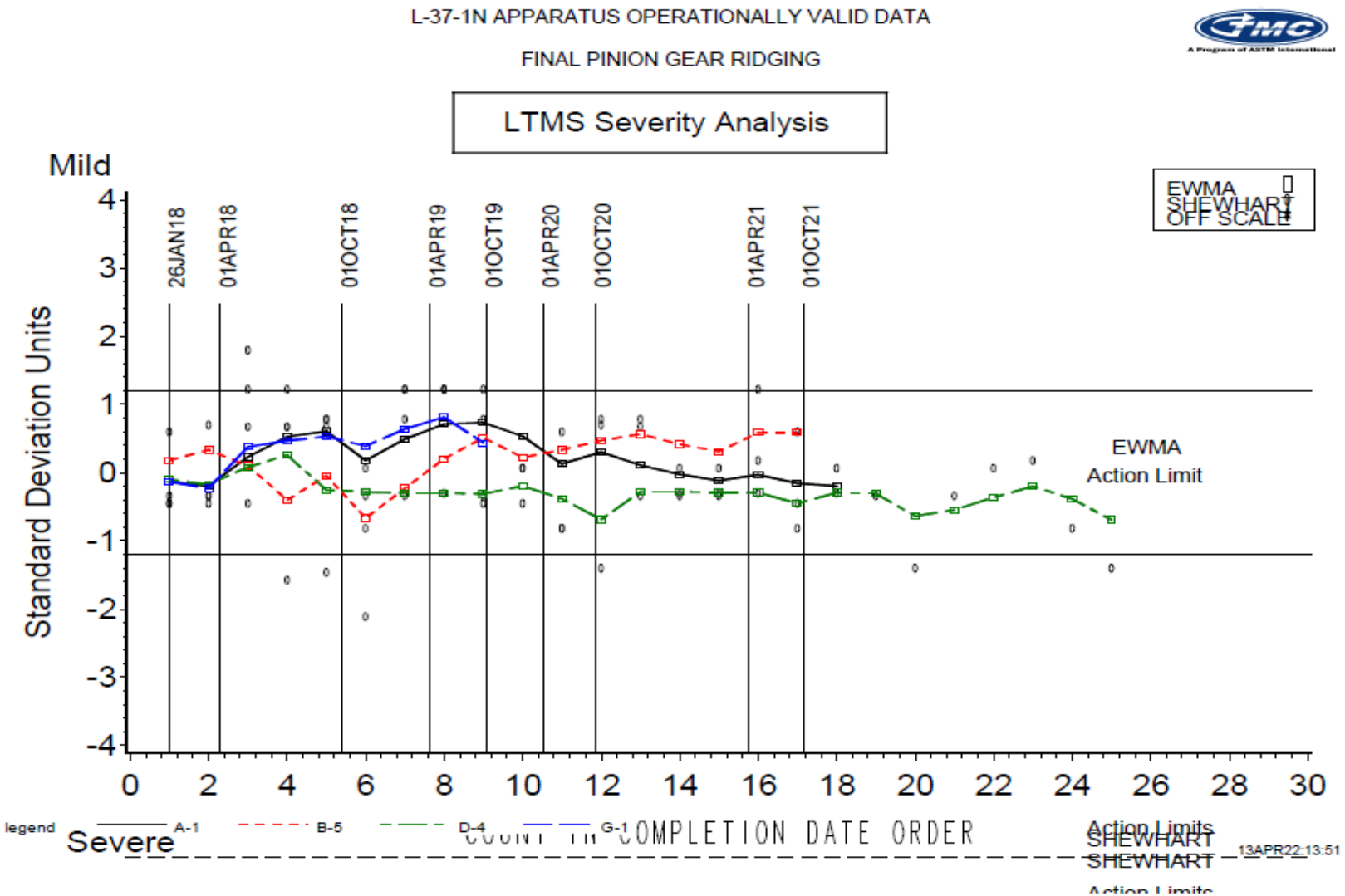
L-37-1 LTMS/TCR Discussion Z(i)=+/- 1.5



L-37-1 LTMS/TCR Discussion Z(i)=+/- 1.5



L-37-1 LTMS/TCR Discussion Z(i)=+/- 1.2



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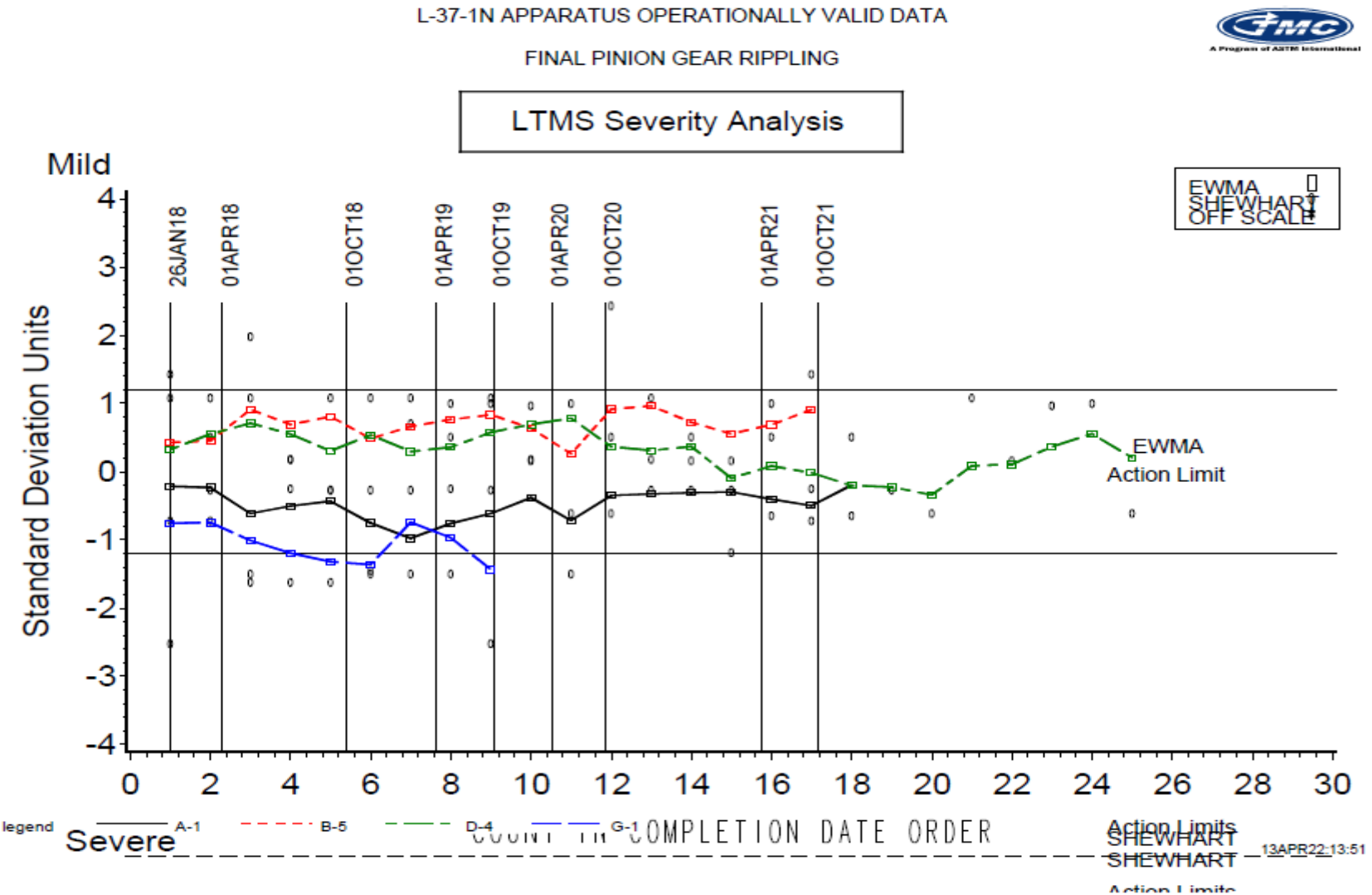
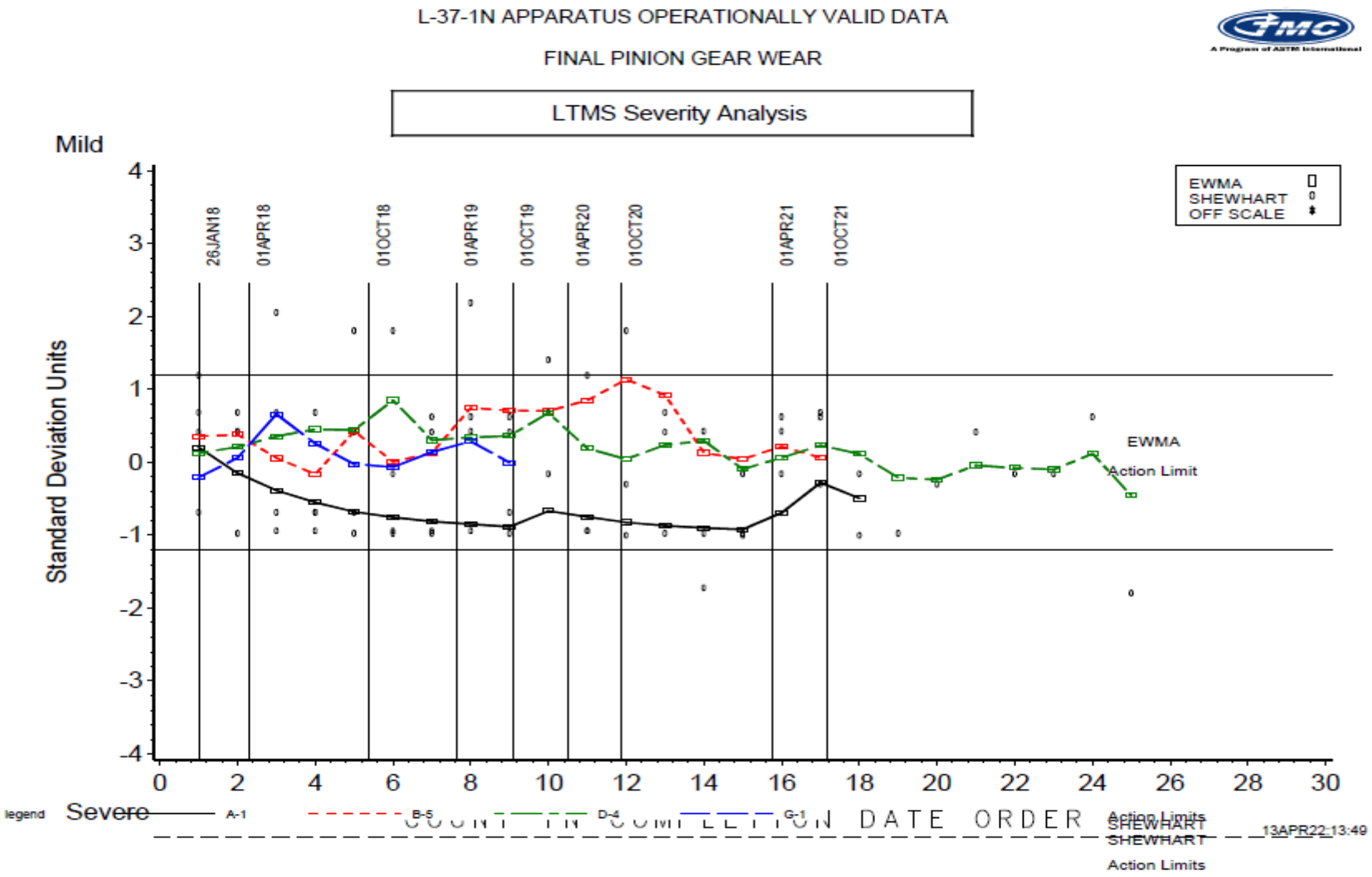


L-37-1 LTMS/TCR Discussion Z(i)=+/- 1.2



Background

- Current L-37-1 LTMS includes:
  1. Stand EWMA (Zi) with lambda = 0.3
     - No consequences for exceeding limit
  2. Stand Shewhart Severity (Yi)
     - Fail if beyond +/- 1.8 standard deviations from target.
       - Integer-valued parameters cause problems here (discussed previously)
  3. If calibration test on 134 or subsequent reblends, it must fail for at least one of the five parameters based on GL-5 limits.
  4. Industry precision and severity also control charted.
- LTMS changes considered in this analysis include:
  1. Updates to oil means and standard deviations.
  2. Implementation of Zi and Ei as calibration pass/fail parameters instead of Yi.

Summary of Targets

Below is a summary of the targets, along with the pooled standard deviations to be used for severity adjustments.

Ridging

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	4.4	0.89
152-2	Nonlubrited	9.3	0.89
155-1	Nonlubrited	9.4	0.49
134/134-1	Lubrited	4.9	0.6
152-2	Lubrited	9.6	0.5
155-1	Lubrited	9.3	0.59

Wear

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	5.5	0.73
152-2	Nonlubrited	7.7	0.72
155-1	Nonlubrited	7.6	0.64
134/134-1	Lubrited	6.1	0.64
152-2	Lubrited	8.2	0.67
155-1	Lubrited	7.7	0.7

Rippling

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	7.8	1.11
152-2	Nonlubrited	8.2	0.74
155-1	Nonlubrited	8.2	0.8
134/134-1	Lubrited	6.8	1.24
152-2	Lubrited	9.3	0.49
155-1	Lubrited	8.7	0.59

Severity Adjustment Standard Deviations

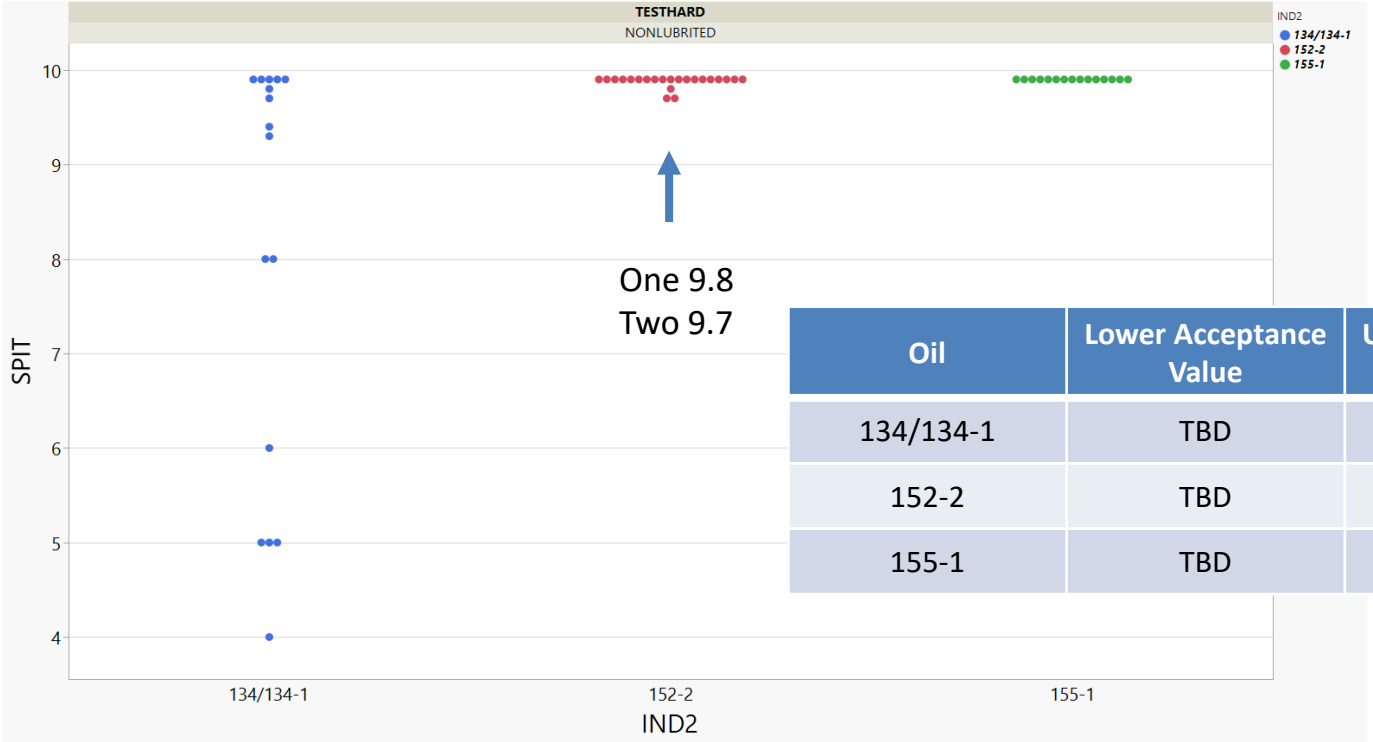
Parameter	Hardware	Pooled S	Option Using 152-2 and 155-1 Only
Ridging	Nonlubrited	0.80	0.69
Rippling	Nonlubrited	0.88	0.77
Wear	Nonlubrited	0.70	0.68
Ridging	Lubrited	0.67	0.55
Rippling	Lubrited	0.89	0.54
Wear	Lubrited	0.67	0.69

Background

At the September 2019 meeting, it was determined that this parameter would move to a Go/No-Go form of acceptance, meaning a reference passes if it achieves a value in a pre-determined, fixed range, and fails otherwise. The Surveillance Panel requested individual plots by oil in order to determine those ranges.

Pitting/Spalling for Nonlubrited Hardware

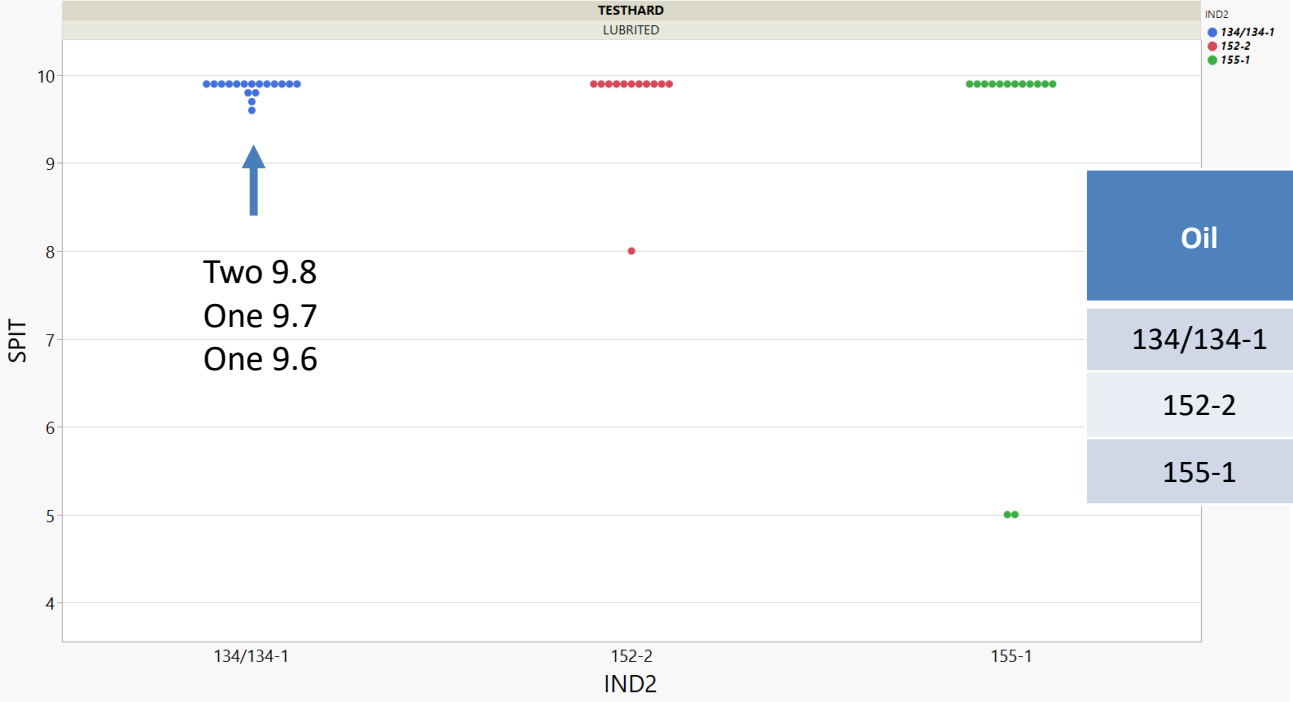
The data is plotted below to help determine upper and lower acceptance values for pitting/spalling.



Oil	Lower Acceptance Value	Upper Acceptance Value
134/134-1	TBD	TBD
152-2	TBD	TBD
155-1	TBD	TBD

Pitting/Spalling for Lubrited Hardware

The data is plotted below to help determine upper and lower acceptance values for pitting/spalling.



Oil	Lower Acceptance Value	Upper Acceptance Value
134/134-1	TBD	TBD
152-2	TBD	TBD
155-1	TBD	TBD

Constants and Limits to Decide

The following are potential constants and limits to use for Zi and Ei:

- Lambda – Recommend to use 0.30
  - Zi is updated by $Z_i = \lambda * Y_i + (1 - \lambda) * Z_{i-1}$
- Zi limit – Recommend to use +/-1.2 to +/-1.5
  - Your stand EWMA can drift up to Zi standard deviations from target
- Ei limits – Recommend to use level 3 limit of +/-2.066 and level 2 limit of +/-1.734
  - Each new calibration test result (Yi) must be within 2.066 standard deviations of where we thought the stand was performing (Z_{i-1}).
- Decide whether or not to adopt severity adjustments
- Acceptance bands for Pitting/Spalling

MnP Coated batch approval process

- Runs?
- Reference Oils?

Gleason Match # Fiasco

- ?

Old Business

- LTMS “Lubrited” removal vote

Example

SCORING
~~Non-lubrited~~ Uncoat~~ed & Lub~~rited MnP Coated Test
Hardware Unit of Measure: Merits

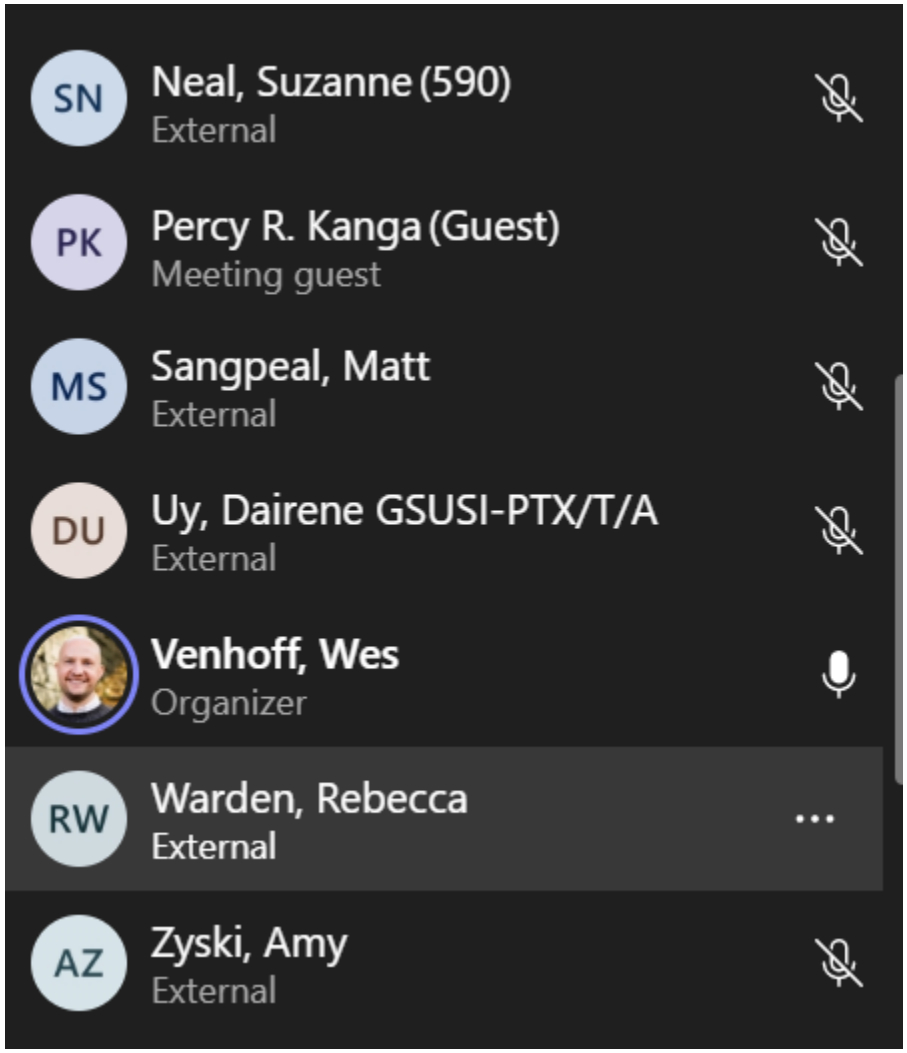
To approve the replacement of Non-Lubrited and Lubrited with Uncoated and MnP Coated respectively throughout the entire LTMS document effective 8/24/2022.

- Labs will need to address wording change in there reporting data base as well

Alternate Codes:	TRNM2VV5B
Test Hardware [A]: NONLUBRITED	

New Business

Adjourn


SN
Neal, Suzanne (590)
External
PK
Percy R. Kanga (Guest)
Meeting guest
MS
Sangpeal, Matt
External
DU
Uy, Dairene GSUSI-PTX/T/A
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Venhoff, Wes
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HF
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Eric (Guest)
Meeting guest
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Micheal Portell Intertek
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